

Skills Worksheet

Active Reading

Section: Modern Systematics

Read the passage below. Then answer the questions that follow.

Most biologists analyze the ancestral relationship, or phylogeny, of organisms using cladistics. **Cladistics** is a method of analysis that reconstructs phylogenies by inferring relationships on the basis of shared characters. Biologists use cladistics to hypothesize the sequence in which different groups of organisms evolved. To do this, a biologist focuses on the nature of the characters in different groups of organisms. When comparing two different groups, a character is defined as an **ancestral character** if it evolved in a common ancestor of both groups. Thus, when considering the relationship between birds and mammals, a backbone is an ancestral character. Feathers, however, are a derived character in birds. A **derived character** evolved in a species that was an ancestor of one group, but not the other. Feathers evolved in an ancestor of birds that was not also an ancestor of mammals.

SKILL: READING EFFECTIVELY

In the space provided, write the letter of the phrase that best completes each statement.

- _____ 1. The phylogeny of a group of organisms is
- its common ancestor.
 - its ancestral relationship to other groups.
 - based on its cladistics.
 - based on derived characters.
- _____ 2. Derived characters are unique traits
- found only in a single species.
 - that mammals lack.
 - found in a particular group of organisms.
 - Both (a) and (b)
- _____ 3. A backbone is an ancestral character in both birds and mammals because it was
- found in a common ancestor of both groups.
 - inherited by birds from mammals.
 - passed on by mammals to birds.
 - common only in one group of organisms.

Active Reading *continued*

Read each question, and write your answer in the space provided.

4. How does cladistics reconstruct phylogenies?

5. What type of information is determined through cladistics?
